

ABSTRACT

The present invention is directed to a metal-promoted zeolite beta catalyst useful in the selective catalytic reduction of nitrogen oxides with ammonia in which the
5 zeolite beta is pre-treated so as to provide the zeolite with improved hydrothermal stability.

The stabilized beta zeolite is provided by incorporating into the zeolite structure non-framework aluminum oxide chains. The aluminum oxide chains can be
10 incorporated into the zeolite structure by a unique steaming regimen or by treatment with rare earth metals, such as cerium. The treatment process is unlike well-known methods of dealuminizing zeolites for the purpose of increasing the silica to alumina ratio. In the present invention, the non-
15 framework aluminum oxide is characterized by FT-IR by a peak at $3781 \pm 2 \text{ cm}^{-1}$, which when present, stabilizes the zeolite against further dealumination such as under oxidizing and harsh hydrothermal conditions.